Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Currently amended) A method of controlling an actuating mechanism of a prosthesis provided on one side of the lower body of an individual to provide coordinated movements, the individual having a healthy leg on the other side, the method comprising:

providing a plurality of artificial proprioceptors, at least one of the artificial proprioceptors being on the side of the healthy leg, and at least one of the artificial proprioceptors being ~~on~~ provided with the prosthesis;

generating data signals in real time at the artificial proprioceptors, the data signals providing information about dynamics of locomotion of the individual; ~~and~~

decomposing the locomotion of the individual based on the information provided by the data signals from both the healthy leg and the prosthesis; and

generating control signals in real time for controlling the actuating mechanism in response to the ~~data signals~~ locomotion of the individual.

Claim 2. (Original) A method according to claim 1, wherein:

at least one of the data signals is supplied via a wired connection.

Claim 3. (Original) A method according to claim 1, wherein:

at least one of the data signals is supplied via a wireless connection.

Claim 4. (Currently amended) A method according to claim 1, wherein:

the actuating mechanism is a passive electromechanical component that absorbs mechanical energy in order to modify dynamics of mechanical joints of the prosthesis.

Claim 5. (Currently amended) A method according to claim 1, wherein:

the actuating mechanism is an active electro-mechanical component that absorbs and supplies mechanical energy in order to modify dynamics of mechanical joints of the prosthesis.

Claim 6. (Original) A method according to claim 1, wherein:

the artificial proprioceptors include myoelectric sensors.

Claim 7. (Currently amended) A method according to claim 6, wherein:

the myoelectric sensors include external electrodes to measure myoelectric activity of skeletal muscles of the individual.

Claim 8. (Original) A method according to claim 6, wherein:

the myoelectric sensors include internal electrodes to measure myoelectric activity of skeletal muscles of the individual.

Claim 9. (Original) A method according to claim 1, wherein:

the artificial proprioceptors include neuro-sensors.

Claim 10. (Original) A method according to claim 9, wherein:

the neuro-sensors are electrodes to measure the summation of one or more action potentials of peripheral nerves of the individual.

Claim 11. (Original) A method according to claim 1, wherein:

the artificial proprioceptors include kinematic sensors.

Claim 12. (Original) A method according to claim 11, wherein:

the kinematic sensors include means for measuring the position of articulated joints of lower extremities parts of the individual.

Claim 13. (Original) A method according to claim 11, wherein:

the kinematic sensors include means for measuring the mobility speed of lower extremities parts of the individual.

Claim 14. (Original) A method according to claim 11, wherein:

the kinematic sensors include means for measuring the mobility acceleration of lower extremities parts of the individual.

Claim 15. (Currently amended) A method according to claim 11, wherein:

at least one of the ~~Kinematic~~ kinematic sensors is located at the shank of the healthy leg of the individual.

Claim 16. (Original) A method according to claim 11, wherein:

at least one of the kinematic sensors is located at a socket of the prosthesis.

Claim 17. (Original) A method according to claim 1, wherein:

the artificial proprioceptors include kinetic sensors.

Claim 18. (Original) A method according to claim 17, wherein:

the kinetic sensors include means for measuring rotational forces at articulated joints of lower extremities parts of the individual.

Claim 19. (Original) A method according to claim 17, wherein:

the kinetic sensors include means for measuring reaction forces at lower extremities parts of the individual.

Claim 20. (Original) A method according to claim 17, wherein:

at least one of the kinetic sensors is located at a transtibial post of the prosthesis.

Claim 21. (Original) A method according to claim 1, wherein:

the artificial proprioceptors include plantar pressure sensors.

Claim 22. (Original) A method according to claim 21, wherein:

the plantar pressure sensors include force-sensing resistors measuring the pressure forces at underfoot areas into at least one human body plan.

Claim 23. (Original) A method according to claim 21, wherein:

at least one of the plantar pressure sensors is located at a metatarsophalangeal region of a foot of the healthy leg; and

at least one of the plantar pressure sensors is located at a calcaneus region of the foot of the healthy leg.

Claim 24. (Original) A method according to claim 21, wherein:

at least one of the plantar pressure sensors is located at a metatarsophalangeal region of a prosthetic foot of the prosthesis; and

at least one of the plantar pressure sensors is located at a calcaneus region of the prosthetic foot of the prosthesis.

Claim 25. (Currently amended) A device for controlling an actuating mechanism of a prosthesis provided on one side of the lower body of an individual to provide coordinated movements, the individual having a healthy leg on the other side, the device comprising:

a plurality of artificial proprioceptors, at least one of the artificial proprioceptors being configured to be positioned on the side of the healthy leg, and at least one of the artificial proprioceptors being configured to be positioned on the side of the prosthesis;

means for generating data signals in real time at the artificial proprioceptors, the data signals providing information about dynamics of locomotion of the individual; ~~and~~

means for decomposing the locomotion of the individual based on the information provided by the data signals from both the healthy leg and the prosthesis; and

means for generating control signals in real time for controlling the actuating mechanism in response to the ~~data signals~~ locomotion of the individual.

Claim 26. (Original) A device according to claim 25, wherein:

at least one of the data signals is supplied via a wired connection.

Claim 27. (Original) A device according to claim 25, wherein:

at least one of the data signals is supplied via a wireless connection.

Claim 28. (Original) A device according to claim 25, wherein:

the actuating mechanism is a passive electromechanical component that absorbs mechanical energy in order to modify dynamics of mechanical joints of the prosthesis.

Claim 29. (Original) A device according to claim 25, wherein:

the actuating mechanism is an active electro-mechanical component that absorbs and supplies mechanical energy in order to modify dynamics of mechanical joints of the prosthesis.

Claim 30. (Original) A device according to claim 25, wherein:

the artificial proprioceptors include myoelectric sensors.

Claim 31. (Original) A device according to claim 30, wherein:

the myoelectric sensors include external electrodes to measure myoelectric activity of skeletal muscles of the individual.

Claim 32. (Original) A device according to claim 30, wherein:

the myoelectric sensors include internal electrodes to measure myoelectric activity of skeletal muscles of the individual.

Claim 33. (Original) A device according to claim 25, wherein:

the artificial proprioceptors include neuro-sensors.

Claim 34. (Original) A device according to claim 33, wherein:

the neuro-sensors are electrodes to measure the summation of one or more action potentials of peripheral nerves of the individual.

Claim 35. (Currently amended) A device according to claim 25, wherein:

the artificial proprioceptors include ~~Kinematic~~ kinematic sensors.

Claim 36. (Original) A device according to claim 35, wherein:

the kinematic sensors include means for measuring the position of articulated joints of lower extremities parts of the individual.

Claim 37. (Original) A device according to claim 35, wherein:

the kinematic sensors include means for measuring the mobility speed of lower extremities parts of the individual.

Claim 38. (Original) A device according to claim 35, wherein:

the kinematic sensors include means for measuring the mobility acceleration of lower extremities parts of the individual.

Claim 39. (Original) A device according to claim 35, wherein:

at least one of the kinematic sensors is located at the shank of the healthy leg of the individual.

Claim 40. (Original) A device according to claim 35, wherein:

at least one of the kinematic sensors is located at a socket of the prosthesis.

Claim 41. (Original) A device according to claim 25, wherein:

the artificial proprioceptors include kinetic sensors.

Claim 42. (Original) A device according to claim 41, wherein:

the kinetic sensors include means for measuring rotational forces at articulated joints of lower extremities parts of the individual.

Claim 43. (Original) A device according to claim 41, wherein:

the kinetic sensors include means for measuring reaction forces at lower extremities parts of the individual.

Claim 44. (Original) A device according to claim 41, wherein:

at least one of the kinetic sensors is located at a transtibial post of the prosthesis.

Claim 45. (Original) A device according to claim 25, wherein:

the artificial proprioceptors include plantar pressure sensors.

Claim 46. (Currently amended) A device according to claim 45, wherein:

the plantar pressure sensors include force-sensing resistors measuring the pressure forces at underfoot areas into at least one human body plan.

Claim 47. (Original) A device according to claim 45, wherein:

at least one of the plantar pressure sensors is located at a metatarsophalangeal region of a foot of the healthy leg; and

at least one of the plantar pressure sensors is located at a calcaneus region of the foot of the healthy leg.

Claim 48. (Original) A device according to claim 45, wherein:

at least one of the plantar pressure sensors is located at a metatarsophalangeal region of a prosthetic foot of the prosthesis; and

at least one of the plantar pressure sensors is located at a calcaneus region of the prosthetic foot of the prosthesis.

Claim 49. (Currently amended) A lower extremities prosthesis configured to be provided on one side of the lower body of an individual to provide coordinated movements, the individual having a healthy leg on the other side, the prosthesis comprising:

a plurality of artificial proprioceptors, at least one of the artificial proprioceptors being configured to be positioned on the side of the healthy leg, and at least one of the artificial proprioceptors being [on] provided with the prosthesis;

means for generating data signals in real time at the artificial proprioceptors, the data signals providing information about dynamics of locomotion of the individual;

means for decomposing the locomotion of the individual based on the information provided by the data signals from both the healthy leg and the prosthesis;

at least one actuating mechanism; and

means for generating control signals in real time for controlling the actuating mechanism in response to the ~~data signals~~ locomotion of the individual.

Claim 50. (Original) A prosthesis according to claim 49, wherein:

at least one of the data signals is supplied via a wired connection.

Claim 51. (Original) A prosthesis according to claim 49, wherein:

at least one of the data signals is supplied via a wireless connection.

Claim 52. (Original) A prosthesis according to claim 49, wherein:

the actuating mechanism is a passive electromechanical component that absorbs mechanical energy in order to modify dynamics of mechanical joints of the prosthesis.

Claim 53. (Original) A prosthesis according to claim 49, wherein:

the actuating mechanism is an active electromechanical component that absorbs and supplies mechanical energy in order to modify dynamics of mechanical joints of the prosthesis.

Claim 54. (Original) A prosthesis according to claim 49, wherein:

the artificial proprioceptors include myoelectric sensors.

Claim 55. (Original) A prosthesis according to claim 54, wherein:

the myoelectric sensors include external electrodes to measure myoelectric activity of skeletal muscles of the individual.

Claim 56. (Original) A prosthesis according to claim 54, wherein:

the myoelectric sensors include internal electrodes to measure myoelectric activity of skeletal muscles of the individual.

Claim 57. (Original) A prosthesis according to claim 49, wherein:

the artificial proprioceptors include neuro-sensors.

Claim 58. (Original) A prosthesis according to claim 57, wherein:

the neuro-sensors are electrodes to measure the summation of one or more action potentials of peripheral nerves of the individual.

Claim 59. (Original) A prosthesis according to claim 49, wherein:

the artificial proprioceptors include kinematic sensors.

Claim 60. (Original) A prosthesis according to claim 59, wherein:

the kinematic sensors include means for measuring the position of articulated joints of lower extremities parts of the individual.

Claim 61. (Original) A prosthesis according to claim 59, wherein:

the kinematic sensors include means for measuring the mobility speed of lower extremities parts of the individual.

Claim 62. (Original) A prosthesis according to claim 59, wherein:

the kinematic sensors include means for measuring the mobility acceleration of lower extremities parts of the individual.

Claim 63. (Original) A prosthesis according to claim 59, wherein:

at least one of the kinematic sensors is located at the shank of the healthy leg of the individual.

Claim 64. (Original) A prosthesis according to claim 59, wherein:

at least one of the kinematic sensors is located at a socket of the prosthesis.

Claim 65. (Original) A prosthesis according to claim 49, wherein:

the artificial proprioceptors include kinetic sensors.

Claim 66. (Original) A prosthesis according to claim 65, wherein:

the kinetic sensors include means for measuring rotational forces at articulated joints of lower extremities parts of the individual.

Claim 67. (Original) A prosthesis according to claim 65, wherein:

the kinetic sensors include means for measuring reaction forces at lower extremities parts of the individual.

Claim 68. (Original) A prosthesis according to claim 65, wherein:

at least one of the kinetic sensors is located at a transtibial post of the prosthesis.

Claim 69. (Original) A prosthesis according to claim 49, wherein:

the artificial proprioceptors include plantar pressure sensors.

Claim 70. (Original) A prosthesis according to claim 69, wherein:

the plantar pressure sensors include force-sensing resistors measuring the pressure forces at underfoot areas into at least one human body plan.

Claim 71. (Original) A prosthesis according to claim 69, wherein:

at least one of the planter pressure sensors is located at a metatarsophalangeal region of a foot of the healthy leg; and

at least one of the plantar pressure sensors is located at a calcaneus region of the foot of the healthy leg.

Claim 72. (Original) A prosthesis according to claim 69, wherein:

at least one of the plantar pressure sensors is located at a metatarsophalangeal region of a prosthetic foot of the prosthesis; and

at least one of the plantar pressure sensors is located at a calcaneus region of the prosthetic foot of the prosthesis.

Claim 73. (New) A method according to claim 4, wherein:

the control signals include a resistance to be applied by the passive electromechanical component to the mechanical joints of the prosthesis.

Claim 74. (New) A method according to claim 5, wherein:

the control signals include joint trajectories and torque to be applied by the active electro-mechanical component to the mechanical joints of the prosthesis.

Claim 75. (New) A device according to claim 28, wherein:

the control signals include a resistance to be applied by the passive electromechanical component to the mechanical joints of the prosthesis.

Claim 76. (New) A device according to claim 29, wherein:

the control signals include joint trajectories and torque to be applied by the active electro-mechanical component to the mechanical joints of the prosthesis.

Claim 77. (New) A prosthesis according to claim 52, wherein:

the control signals include a resistance to be applied by the passive electromechanical component to the mechanical joints of the prosthesis.

Claim 78. (New) A prosthesis according to claim 53, wherein:

the control signals include joint trajectories and torque to be applied by the active electro-mechanical component to the mechanical joints of the prosthesis.